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Proposed Action Memorandum

**Landfill Leachate Collection
Operable Unit No 7 — Present Landfill (IHSS 114) and
Inactive Hazardous Waste Storage Area (IHSS 203)**

Draft Report

September 16 1994

Rocky Flats Environmental Technology Site
Golden Colorado

ADMIN RECORD

1/26

NOTICE

All drawings located at the end of the document.

Proposed Action Memorandum

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Inactive Hazardous Waste Storage Area (IHSS 203)**

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Rocky Flats Environmental Technology Site
Golden, Colorado

EG&G Rocky Flats Plant
OU 7 Draft Proposed Action Memorandum
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Rev 0
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**Proposed Action Memorandum
Landfill Leachate Collection
Operable Unit No. 7 — Present Landfill (IHSS 114) and
Inactive Hazardous Waste Storage Area (IHSS 203)**

APPROVED BY

Group II Closures Manager

Date

Project Manager

Date

QA Manager

Date

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EXECUTIVE SUMMARY

This Landfill Leachate Collection Proposed Action Memorandum presents the U S Department of Energy's proposed action to address leachate seeping from the Present Landfill into the East Landfill Pond, Operable Unit (OU) No 7 at the Rocky Flats Environmental Technology Site. The overall objective of the collection system is to eliminate illegal discharge of leachate, which is an FO39 listed hazardous waste, to a surface water body.

Compliance with potential applicable or relevant and appropriate requirements will be achieved through collection of leachate, treatment of the collected flow to reduce concentrations of volatile organic compounds, semi-volatile organic compounds, metals, and radionuclides, and subsequent release of treated water to surface waters.

Leachate will be collected at the leachate seep (SW097) with a French drain installed downgradient of the seep. The drain will extend 40 feet perpendicular to the seep flow, have a downgradient barrier, and be keyed into unweathered bedrock. High-density polyethylene pipe will feed leachate flow into a collection manhole. A submersible pump will deliver leachate from the manhole to storage tanks located on the ridge immediately north of the East Landfill Pond dam along an existing gravel road. Leachate will then be transported by tanker truck to the sitewide OU 1/OU 2 treatment facility.

Construction is scheduled for May 1995 to August 1995. The collection system is designed to be consistent with final closure, with minor modifications to the system, leachate and groundwater collection will be continued after the landfill cap is in place. Landfill closure is scheduled for July 1997.

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1 PURPOSE

The purpose of this Landfill Leachate Collection Proposed Action Memorandum (PAM) is to request approval of the U S Department of Energy's (DOE's) proposed action for the collection and treatment of leachate seeping from the Present Landfill into the East Landfill Pond, Operable Unit (OU) No 7 at the Rocky Flats Environmental Technology Site (RFETS). RFETS is located in Jefferson County, Colorado, as shown in Figure 1-1. This document is the first of two remedial action documents planned for OU 7. The second document, the Landfill Closure Interim Measure/Interim Remedial Action (IM/IRA) Decision Document, will focus on landfill closure and groundwater remediation using the presumptive remedy approach (EPA, 1993).

The overall objective of the landfill leachate collection system is to eliminate the illegal discharge of leachate, which is an FO39 listed waste, to a surface water body. The proposed action will achieve potential applicable or relevant and appropriate requirements (ARARs), if practicable, through collection and treatment of seep water to remove organics and metals.

Environmental restoration activities at RFETS are pursuant to an Interagency Agreement (IAG) among the DOE, the U S Environmental Protection Agency (EPA), and the State of Colorado Department of Public Health and Environment (CDPHE) dated January 22, 1991 (DOE, 1991). CDPHE is the lead regulatory agency for the IAG program at OU 7.

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2 BACKGROUND AND DESCRIPTION

The location and mission of RFETS, location and history of remedial actions at OU 7, characteristics of the landfill leachate, and other actions to date are described in the following sections

2.1 Rocky Flats Environmental Technology Site

The RFETS is located at the foot of the Rocky Mountains in northern Jefferson County, Colorado. The site is approximately 16 miles northwest of Denver in Sections 1 through 4 and 9 through 15 of Township 2 south, Range 70 west. It is near the suburban communities of Westminster, Broomfield, and Arvada. The site covers approximately 6,550 acres. Approximately 400 acres were used for industrial activities.

The primary mission of RFETS has been production of components for nuclear weapons. Operations at the plant began in 1952. In 1989, many of the production functions at the plant were suspended. In January 1992, the decision was made not to resume plutonium production. The site is currently in transition from a weapons production site to an environmental restoration and waste management site.

More detailed site background information is presented in the OU 7 Final Work Plan Technical Memorandum (OU 7 Final Work Plan) (DOE, 1994).

2.2 OU 7 Site Description

OU 7 is located north of the industrial area at the western end of No Name Gulch. For the purpose of selecting remedial actions, OU 7 is divided into the following four areas:

- Present Landfill (Individual Hazardous Substance Site [IHSS] 114)
- Inactive Hazardous Waste Storage Area (IHSS 203)
- East Landfill Pond
- Spray evaporation areas adjacent to the East Landfill Pond (including IHSS 167.2 and IHSS 167.3)

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Each of these areas is shown in Figure 2-1 and described in detail in the OU 7 Final Work Plan (DOE, 1994)

The leachate seep addressed in this report is located near the base of the east face of the Present Landfill (IHSS 114). Operation of the landfill was initiated in 1968 to provide for disposal of nonradioactive solid wastes and will continue until the new landfill is opened. The Present Landfill covers an area of approximately 27 acres.

In 1973, tritium was detected in leachate draining from the landfill. In response, a sampling program was undertaken to determine the location of the tritium source. Monitoring of waste for radionuclides prior to burial was initiated to prevent further disposal of radioactive material, and interim response measures were developed to control the generation and migration of the landfill leachate. Locations of the landfill structures (surface-water diversion ditch, groundwater intercept system, and slurry walls) constructed as interim response measures that still exist are shown in Figure 2-1 and described in detail in the OU 7 Final Work Plan (DOE, 1994).

Records indicate that some hazardous waste was disposed at the landfill, therefore, it was designated as an interim status Resource Conservation and Recovery Act (RCRA) regulated unit and included in the Part B permit application for RFETS.

2.3 Leachate Characteristics at Seep SW097

The existing leachate collection system at the landfill is only partially effective. Between 1977 and 1981, portions of the leachate collection system were buried during landfill expansion. Although the intercept trench is effective in keeping leachate within the northern, southern, and western limits of the landfill, the leachate seeps out along the eastern boundary of the landfill just above the pond.

Surface water sampling station SW097 is located where the leachate seeps from the landfill into the pond. The physical area of the seepage face is believed to vary over the course of the year. Based on visual observations, however, the maximum seep width is estimated at 8 feet.

Historical data presented in Table 2-1 were used to estimate an average flow rate at the seep. Specific information on the method of measurement and the relationship to storm events for most of this data is not available. Using RFETS precipitation data, no relationship between storm events and measured high flows shown in the table could be established. Thus, disregarding measurements believed to be erroneous, the average flow at the seep is estimated to be 3.6 gallons per minute (gpm).

Table 2-1
Historical Leachate Flow Rates at SW097

| Date of Measurement | Flow Rate (gpm) | Flow Rate (cfs) |
|---------------------|-------------------|--------------------|
| 06/16/88 | 2 2 | 0 005 |
| 04/06/89 | 26 9 ¹ | 0 06 ¹ |
| 05/19/89 | 0 0 | 0 0 |
| 06/20/89 | 0 0 | 0 0 |
| 07/07/89 | 3 6 | 0 008 |
| 08/02/89 | 4 0 | 0 009 |
| 09/06/89 | 2 2 | 0 005 |
| 10/09/89 | 24 7 ¹ | 0 05 ¹ |
| 11/07/89 | 1 8 | 0 004 |
| 12/05/89 | 1 8 | 0 004 |
| 08/29/90 | 6 7 ² | 0 015 ² |
| 12/17/92 | 4 48 | 0 01 |
| 01/25/93 | 4 48 | 0 01 |
| 02/26/93 | 10 32 | 0 023 |
| 03/24/93 | 04 48 | 0 01 |
| 03/29/93 | 4 48 | 0 01 |
| Average | 3 61 | |

¹ Believed to be an erroneous flow measurement Not included in calculation of average flow

² Measured using a Palmer-Bowlus flume

Definitions

cfs cubic feet per second
gpm gallons per minute

Chemicals in the leachate that exhibit concentrations above background include total and dissolved metals, radionuclides, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) (DOE, 1994)

Although it has not been designated as a wetland, the East Landfill Pond exhibits typical wetland vegetation as discussed in the potential ARARs section (Section 3 5) of this PAM

2 4 Other Actions To Date

A Phase I RCRA Facility Investigation/Remedial Investigation (RFI/RI) was conducted at OU 7 in 1992 and 1993 to characterize the site features, describe contaminant sources, and determine the nature and extent of contamination Prior to the completion of Phase I, the focus of the investigations changed as a result of the adoption of a presumptive remedy strategy

This PAM and the forthcoming IM/IRA for OU 7 are based on use of presumptive remedies as a method to streamline site investigation and remedial action selection based on historical data from successful remedial actions at similar sites. Source containment is the designated presumptive remedy for Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) municipal landfills (EPA, 1993). The containment presumptive remedy consists of the following elements:

- institutional controls
- landfill cap
- landfill gas control (and treatment if necessary)
- source area groundwater control to contain plume
- leachate collection and treatment

The proposed remedial action, collection and treatment of leachate seep water, is compatible with source containment as a presumptive remedy for the landfill.

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3 PROPOSED ACTION

A description of the proposed action is presented in this section. Waste management considerations, consistency with long-term actions, and potential ARARs are also discussed. The Title II design is presented as Appendix A.

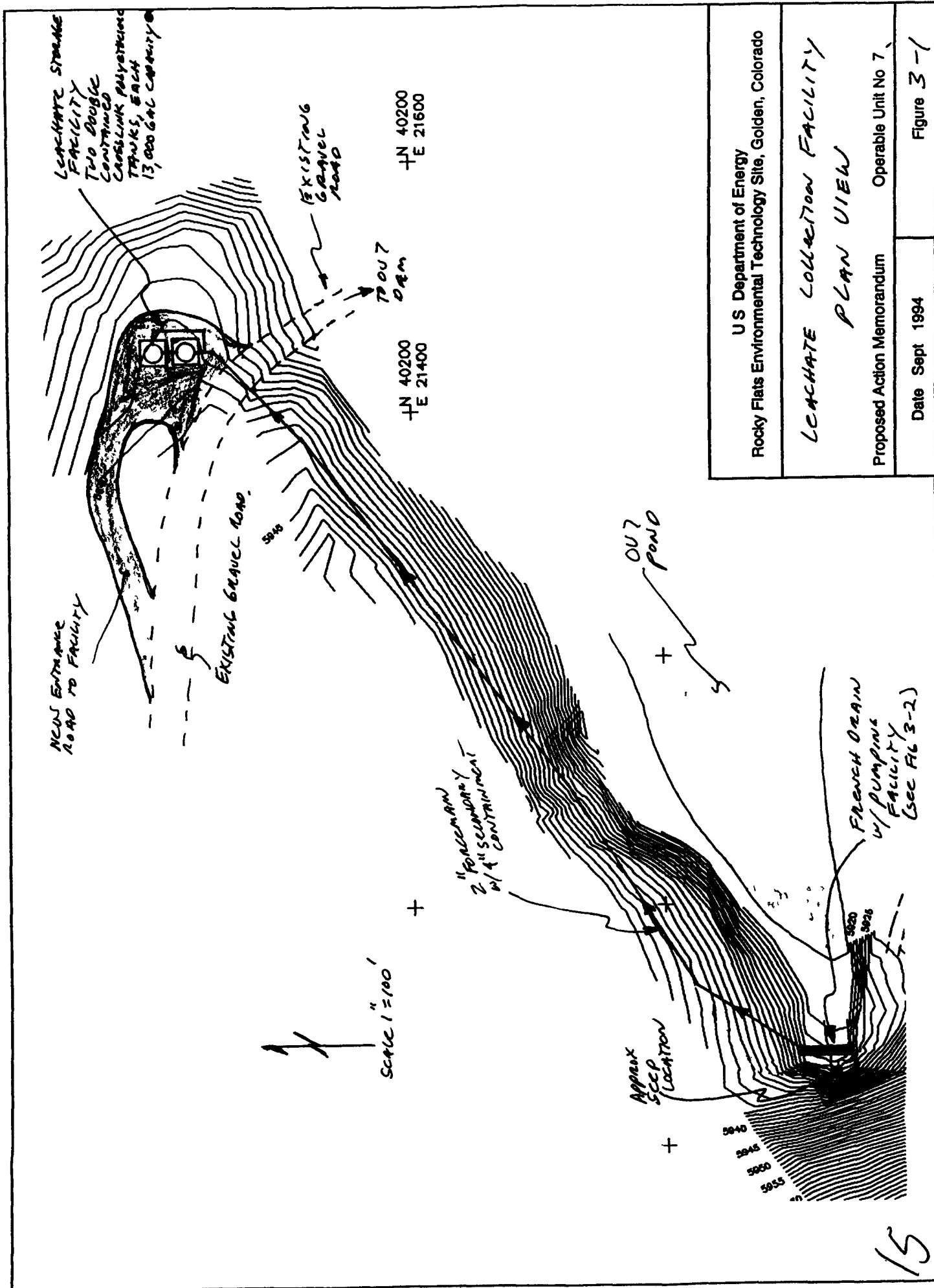
3.1 Description

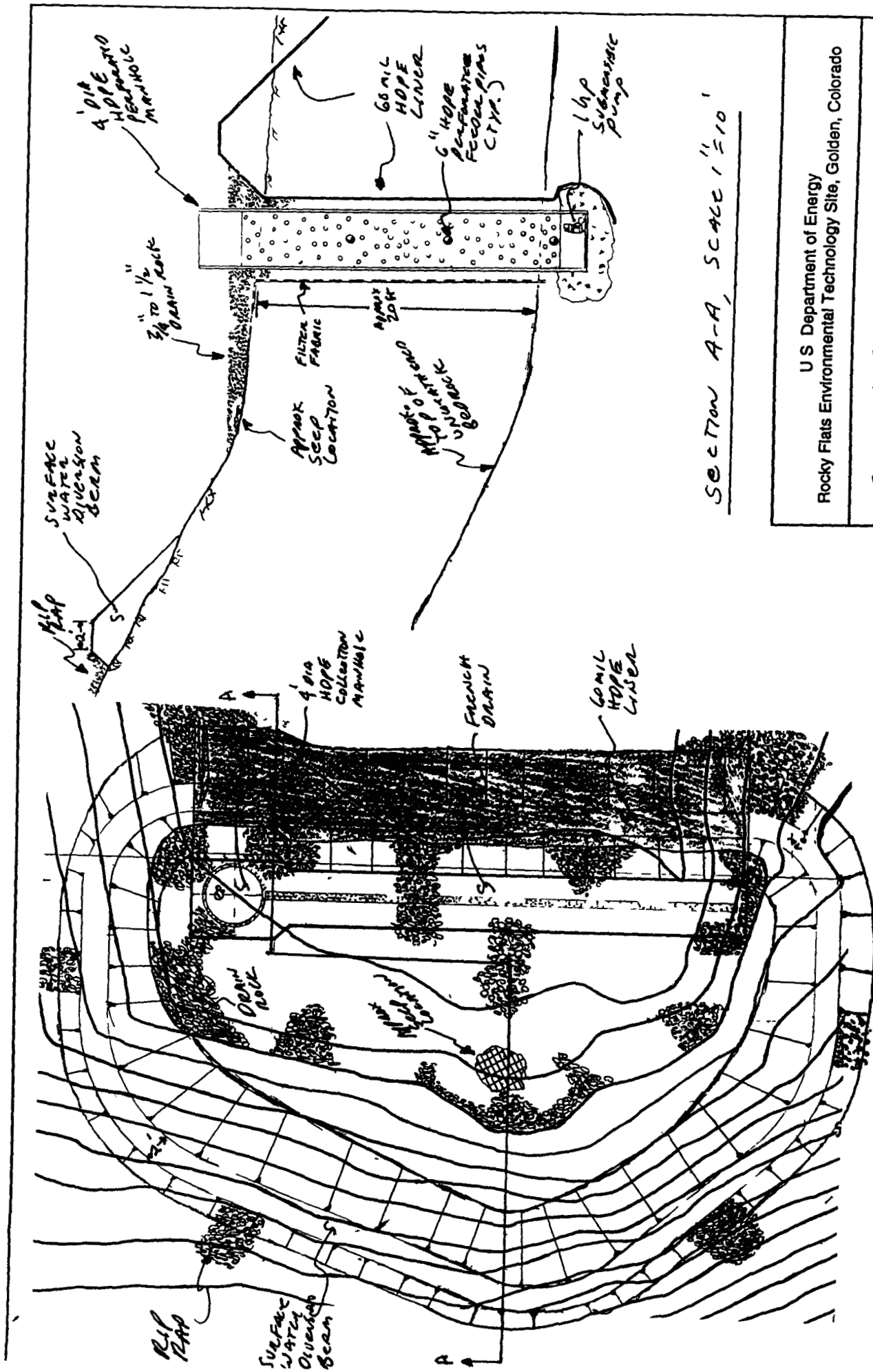
Leachate will be collected at SW097 with a French drain constructed downgradient of the seep, as shown in Figures 3-1 and 3-2. The drain will intercept and contain seep water and groundwater flowing into the area. The downgradient trench wall will be lined with an impermeable barrier that consists of a 60-mil high-density polyethylene (HDPE) liner to prevent downgradient migration. The barrier also prevents water from flowing upgradient toward the drain. The upgradient trench wall will be lined with filter fabric to minimize fine sediment movement into the drain. The drain will be backfilled with ¾-inch to 1½-inch drain rock. The drain will be 4-feet wide, extend 40 feet perpendicular to the seep flow, and be keyed into unweathered bedrock, which is estimated at a depth of 20 feet.

Three 6-inch perforated HDPE pipes will be installed in the trench perpendicular to the flow at varying depths and will feed a perforated manhole located in the north part of the trench. A submersible pump with a capacity of 20 gpm will be installed at the bottom of the manhole to deliver the leachate flow to the storage tanks. Power will be run from the DOE firing range to the leachate storage site at OU 7.

A surface-water diversion berm will be constructed upslope of the French drain to prevent collection of excess surface flows and sediments from storm water runoff. Rip rap will be used to stabilize the slope. A detention berm will also be constructed immediately downstream of the French drain to prevent seep water from bypassing the drain during high-flow events.

In addition to the average 3.6 gpm seep flow (Section 2.3), the French drain will intercept subsurface flow. This flow is estimated to be 0.5 gpm based on analytical evaluations of groundwater flow, therefore, the average flow to the drain is expected to be 4 gpm.





PLAN VIEW, SCALE 1"=10'

SECTION A-A, SCALE 1"=10'

| | |
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| U S Department of Energy Rocky Flats Environmental Technology Site, Golden, Colorado | |
| FRENCH DRAIN DETAILS | |
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Two double contained crosslink polyethelene tanks will provide a storage capacity of 13,000 gallons each. At an average flow of 4 gpm, the tanks have a 4.5 day capacity. The stored leachate will be transported as necessary to the sitewide OU 1/OU 2 treatment facility by tanker truck. In the event the tanks reach maximum capacity, a high-level alarm will shut off the sump pump and seep flow will back up in the manhole.

The leachate will be trucked to the new sitewide treatment facility, which combines the former OU 1 and OU 2 facilities with new pretreatment and additional storage capacity. The OU 1 facility consists of ultraviolet oxidation and ion exchange units. OU 2 includes chemical precipitation/filtration and granular activated carbon (GAC) units. A schematic showing the proposed treatment schemes at the new combined facility that can be used to treat the leachate is presented in Figure 3-3.

Discussions with treatment facility operators indicate that the facility has the capacity and the capability to effectively treat the chemicals found in the landfill leachate. However, no acceptance criteria or removal efficiencies for the new treatment facility are available at this writing. A treatment train will be developed and optimized based on bench scale testing.

The following assumptions are incorporated into the development of the PAM:

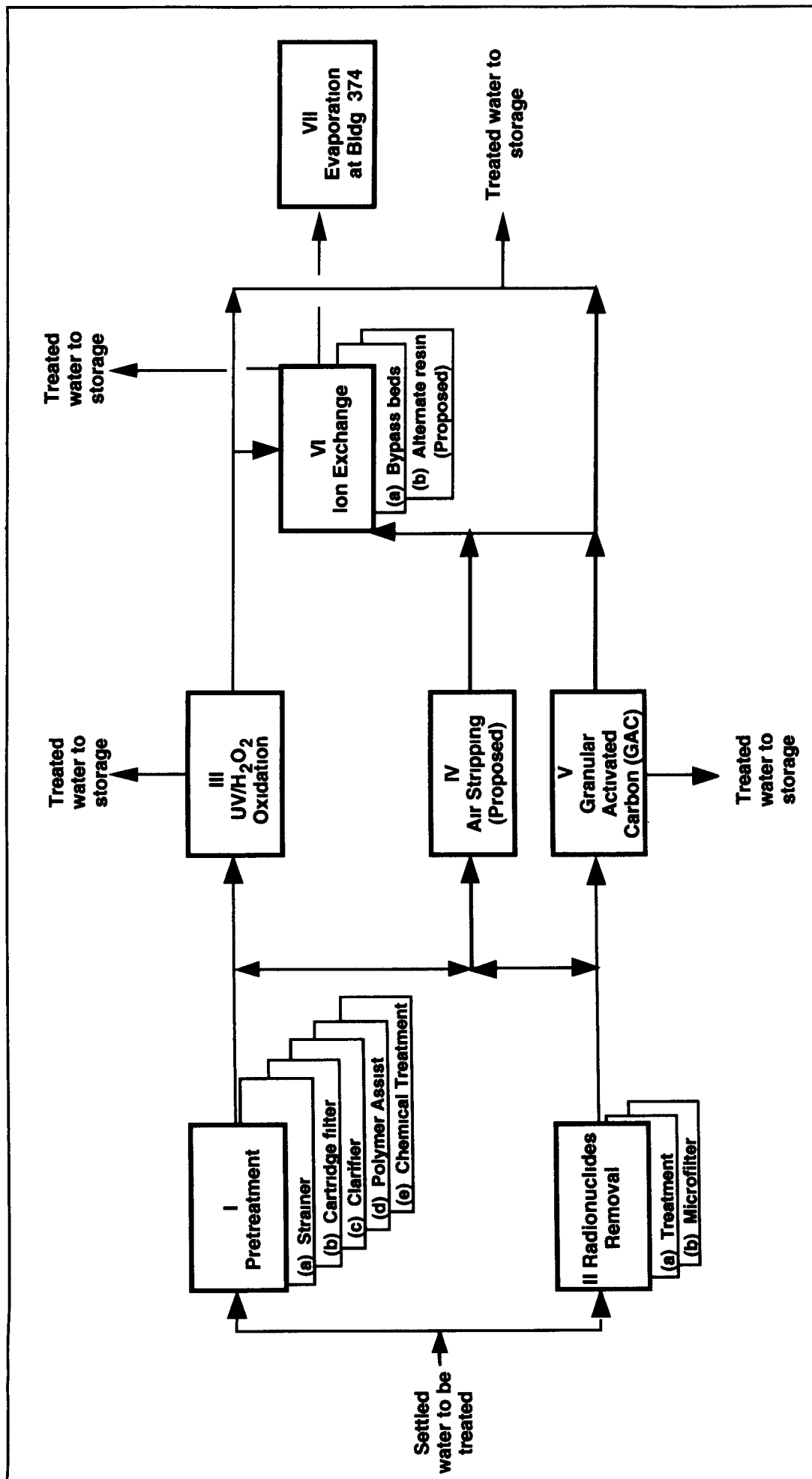
- Drainage of the pond will occur prior to installation of the leachate collection system.
- Design flows are 4 gpm average and 10 gpm maximum.
- The sitewide treatment facility will be operational when construction of the collection system is complete.

3.2 Design

The Title II (95%) design for the OU 7 leachate collection system is included as Appendix A. The drawings and specifications include the leachate collection and storage systems.

3.3 Waste Management Considerations

Materials excavated during construction that cannot be backfilled will be disposed at the OU 7 landfill. Water from dewatering during construction will be pumped to the pond.



NOTES.

- 1 Treatment path for OU7 leachate to be determined by characterization or bench testing
 - 2 No provision is shown for removal of free product
 - 3 Storage is used to verify treatment before release
 - 4 Granular activated carbon can also be used as final polishing step
- Source Danzberger & Associates, 7/20/94

U S Department of Energy
Rocky Flats Environmental Technology Site, Golden, Colorado

Proposed OU 1/OU 2 Water Treatment Schemes

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Figure 3-3

| | | |
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3.4 Consistency with Long-Term Actions

The leachate collection system is designed to be easily modified for continued leachate and groundwater collection during post-closure remediation

- Risers will be added to extend the access manhole to the elevation of the cap at closure
- The pump will be outfitted with quick disconnect fittings so it can easily be removed for maintenance throughout the 30-year life of the project
- The manhole and all buried piping will be designed to maintain structural integrity under the increased loadings due to placement of fill and the final cap
- Leachate storage tanks will be located outside the proposed extent of the cap so that they can be used for groundwater storage during post-closure remediation

3.5 Potential ARARs

Potential ARARs for OU 7 are discussed in detail in *Potential Applicable or Relevant and Appropriate Requirements for Operable Unit No. 7* (EG&G, 1994a)

EPA guidance directs that cleanup actions presume that groundwater be considered a potential source of drinking water unless site-specific factors indicate otherwise. Therefore, all federal and state chemical-specific water standards have been listed as potential ARARs for OU 7. They include the following:

- Safe Drinking Water Act maximum contaminant levels (MCLs)
- RCRA groundwater protection standards
- Colorado Water Quality Control Act surface-water standards (general and site-specific)
- Colorado Water Quality Control Act groundwater standards (general and site-specific)
- Colorado primary drinking water regulations

Although it has not been designated as a wetland, the East Landfill Pond exhibits typical wetland vegetation. Tall marsh occurs on the edge of the pond, short marsh occurs north and south of the pond throughout the spray evaporation areas. Consequently, the Clean Water Act Section 404 permitting requirements and Executive Order 11990, Wetland Assessment, have been identified as potential ARARs. Mitigation of wetlands issues will be addressed during the forthcoming Landfill Closure IM/IRA.

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The Endangered Species Act, Bald and Golden Eagle Protection Act, and the Colorado Nongame, Endangered or Threatened Species Conservation Act have all been identified as potential ARARs because of the existence of regulated species under those acts in and around RFETS. No studies address the presence of wildlife at OU 7, however, other studies measuring the presence of plant and animal life at RFETS indicate that several regulated species are located at the site. Neither RFETS nor OU 7 has been identified as critical habitat for any regulated species (DOE, 1994).

ARARS for OU 1 and OU 2 are used as potential chemical-specific ARARs for chemicals in the leachate at SW097 that were found above background. For constituents for which no OU 1 or OU 2 ARARs exist, MCLs are used as potential ARARs. Where no ARARs or MCLs exist, EPA Contract Laboratory Program (CLP) analytical detection limits are used as potential ARARs. These potential ARARs are presented in Table 3-1.

Table 3-1
Potential ARARs

| Total Metals | Ave Conc (µg/L) | Max Conc (µg/L) | OU 1 ARAR (µg/L) | OU 2 ARAR (µg/L) | Other | Reference |
|------------------------|-----------------|-----------------|------------------|------------------|-------|----------------------------------|
| Antimony | 22 | 60.4 | 60 | 6 | — | OU 1/OU 2 IM/IRA ARAR |
| Barium | 640 | 1,550 | 1,000 | 1,000 | — | OU 1/OU 2 IM/IRA ARAR |
| Calcium ¹ | 151,000 | 212,000 | N/A | N/A | — | — |
| Iron | 80,510 | 155,000 | 300 | 300 | — | OU 1/OU 2 IM/IRA ARAR |
| Lithium | 48 | 107 | 2,500 | NS | — | OU 1 IM/IRA ARAR |
| Magnesium | 34,719 | 49,000 | N/A | N/A | — | — |
| Manganese | 1,611 | 2,490 | 50 | 1 | — | OU 1/OU 2 IM/IRA ARAR |
| Potassium ¹ | 6,438 | 11,700 | N/A | N/A | — | — |
| Silicon ¹ | 13,508 | 44,000 | N/A | N/A | — | — |
| Sodium ¹ | 71,367 | 110,000 | N/A | N/A | — | — |
| Strontium | 919 | 1,370 | — | — | 200 | CLP Detection Limit ² |
| Tin | 67 | 306 | — | — | 200 | CLP Detection Limit ² |
| Zinc | 2,945 | 16,000 | 2,000 | 50 | — | OU 1/OU 2 IM/IRA ARAR |

| Radionuclides | Ave Conc. (pCi/L) | Max Conc (pCi/L) | OU 1 ARAR (pCi/L) | OU 2 ARAR (pCi/L) | Other | Reference |
|-----------------|-------------------|------------------|-------------------|-------------------|-------|---------------------------------------|
| Gross Beta | 11 | 17 | 50 | 19 | — | OU 1/OU 2 IM/IRA ARAR |
| Strontium-89,90 | 1.3 | 4.06 | 8 | 8 | — | OU 1/OU 2 IM/IRA ARAR |
| Tritium | 349 | 1,500 | NS | 500 | — | OU 1/OU 2 IM/IRA ARAR |
| Uranium-235 | 0.1 | 0.7 | 40 | 10 | — | OU 1/OU 2 IM/IRA ARAR (Uranium Total) |

| Water Quality Parameters | Ave. Conc (µg/L) | Max. Conc. (µg/L) | OU 1 ARAR (µg/L) | OU 2 ARAR (µg/L) | Other | Reference |
|--------------------------|------------------|-------------------|------------------|------------------|---------|-----------------------|
| Chloride | 54,000 | 66,000 | 250,000 | 250,000 | — | OU 1/OU 2 IM/IRA ARAR |
| Nitrate | 30.33 | 63 | 1,000 | 1,000 | — | OU 1/OU 2 IM/IRA ARAR |
| Total Dissolved Solids | 730,000 | 870,000 | 400,000 | 400,000 | — | OU 1/OU 2 IM/IRA ARAR |
| Total Suspended Solids | 145,000 | 250,000 | — | — | 500,000 | SWDA MCL |

Table 3-1 (continued)

| Volatile Organic Compounds | Ave. Conc. (µg/L) | Max. Conc. (µg/L) | OU 1 ARAR (µg/L) | OU 2 ARAR (µg/L) | Other | Reference |
|----------------------------|-------------------|-------------------|------------------|------------------|-------|----------------------------------|
| 1,1-Dichloroethane | 6 | 10 | 5 | 5 | — | OU 1/OU 2 IM/IRA ARAR |
| 2-Butanone | 12 | 76 | — | — | 10 | CLP Detection Limit ² |
| 2-Hexanone | 5 | 10 | — | — | 10 | CPL Detection Limit ² |
| 4-Methyl-2-pentanone | 11 | 87 | — | — | 10 | CLP Detection Limit ² |
| Acetone | 33 | 220 | 50 | 10 | — | OU 1/OU 2 IM/IRA ARAR |
| Benzene | 2 | 5 | — | — | 140 | 40 CFR 268.43 |
| Carbon Disulfide | 3 | 6 | 5 | 5 | — | OU 1/OU 2 IM/IRA ARAR |
| Chloroethane | 22 | 57 | — | — | 270 | 40 CFR 268.43 |
| Chloromethane | 5 | 10 | — | — | 190 | 40 CFR 268.43 |
| Ethylbenzene | 13 | 18 | — | — | 10 | CLP Detection Limit ² |
| Methylene Chloride | 14 | 190 | 5 | 5 | — | OU 1/OU 2 IM/IRA ARAR |
| Total Xylenes | 14 | 25 | — | — | 320 | 40 CFR 268.43 |
| Tetrachloroethene | 2 | 5 | 5 | 2 | — | OU 1/OU 2 IM/IRA ARAR |
| Toluene | 38 | 88 | 2,000 | NS | — | OU 1 IM/IRA ARAR |
| Trichloroethene | 2 | 5 | 5 | NS | — | OU 1 IM/IRA ARAR |
| Vinyl Acetate | 7 | 49 | — | — | 50 | SW-846 Method Detection Limit |
| Vinyl Chloride | 5 | 11 | NS | 2 | — | OU 1/OU 2 IM/IRA ARAR |

| Semivolatile Organic Compounds | Ave. Conc. (µg/L) | Max. Conc. (µg/L) | OU 1 ARAR (µg/L) | OU 2 ARAR (µg/L) | Other | Reference |
|--------------------------------|-------------------|-------------------|------------------|------------------|-------|----------------------------------|
| 2,4-Dimethylphenol | 5 | 10 | — | — | 36 | 40 CFR 268.43 |
| 2-Methylnaphthalene | 16 | 23 | — | — | 10 | CLP Detection Limit ² |
| 4-Methylphenol | 4 | 10 | — | — | 10 | CLP Detection Limit ² |
| Acenaphthene | 3 | 3 | — | — | 59 | 40 CFR 268.43 |
| Bis(2-ethylhexyl)phthalate | 5 | 12 | — | — | 280 | 40 CFR 268.43 |
| Dibenzofuran | 1 | 2 | — | — | 10 | CLP Detection Limit ² |
| Diethyl Phthalate | 3 | 10 | — | — | 200 | 40 CFR 268.43 |
| Fluorene | 2 | 3 | — | — | 59 | 40 CFR 268.43 |
| Naphthalene | 18 | 22 | — | — | 59 | 40 CFR 268.43 |
| Phenanthrene | 4 | 5 | — | — | 59 | 40 CFR 268.43 |

Source (EG&G, 1994b)

¹ Nutrient species and will not be considered for treatment.

² Matrix dependent. Detection limit may vary by method.

Note: Shaded compounds are below the given ARARs at OU 7.

Definitions

CLP EPA Contract Laboratory Program

N/A Not applicable

NS No standard

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4 SUMMARY OF RISK

Factors specified in the National Contingency Plan (NCP) Section 300 415(b)(2) indicate that a removal action is appropriate for the OU 7 leachate seep to address threats to public health and welfare and the environment. The seep water is an FO39 waste. It may be a source of contamination for both surface water and groundwater, which, in turn, provide potential pathways for further migration. Exposure scenarios include dermal contact and ingestion by RFETS workers and offsite residents in downgradient communities. Substances of concern include the organics, heavy metals, and radionuclides listed in Table 3-1.

Although there is no documentation of negative effects on populations of plants or animals at the site, the seep is believed to be a source of the radionuclides, VOCs, and SVOCs present in pond sediments (DOE, 1994).

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Name Date

5 PROJECT SCHEDULE

The accelerated schedule for the Landfill Leachate Collection PAM supersedes the Table 6 milestones in the IAG. The proposed milestone schedule is provided in Table 5-1.

Table 5-1
OU 7 Leachate Collection Proposed Action
Milestone Schedule

| Milestone | Date |
|--|----------|
| Submit PAM to CDPHE/EPA/Public | 10/14/94 |
| Receive Comments | 11/14/94 |
| Submit Final PAM & Response Summary to CDPHE/EPA/DOE | 11/30/94 |
| Approval of PAM | 12/14/95 |
| Begin Construction | 05/15/95 |
| Begin Leachate Collection | 08/16/95 |

10/13/94
11/13/94

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| | | |
|---------------------------------------|----------------|------------------|
| EG&G Rocky Flats Plant | Manual | RF/ER-94-00044 |
| OU 7 Draft Proposed Action Memorandum | Section | Section 6, Rev 0 |
| Technical Memorandum | Page | 19 of 19 |
| Category | Effective Date | |
| | Organization | RPD |

Approved By

Title
Section 6

Name

Date

6 REFERENCES

DOE 1991 Federal Facility Agreement and Consent Order (Interagency Agreement [IAG]
U S DOE, U S EPA, and CDH), U S Department of Energy, Washington D C January

DOE 1994 Final Work Plan Technical Memorandum for Operable Unit No 7 Rocky Flats
Plant, Golden, Colorado September

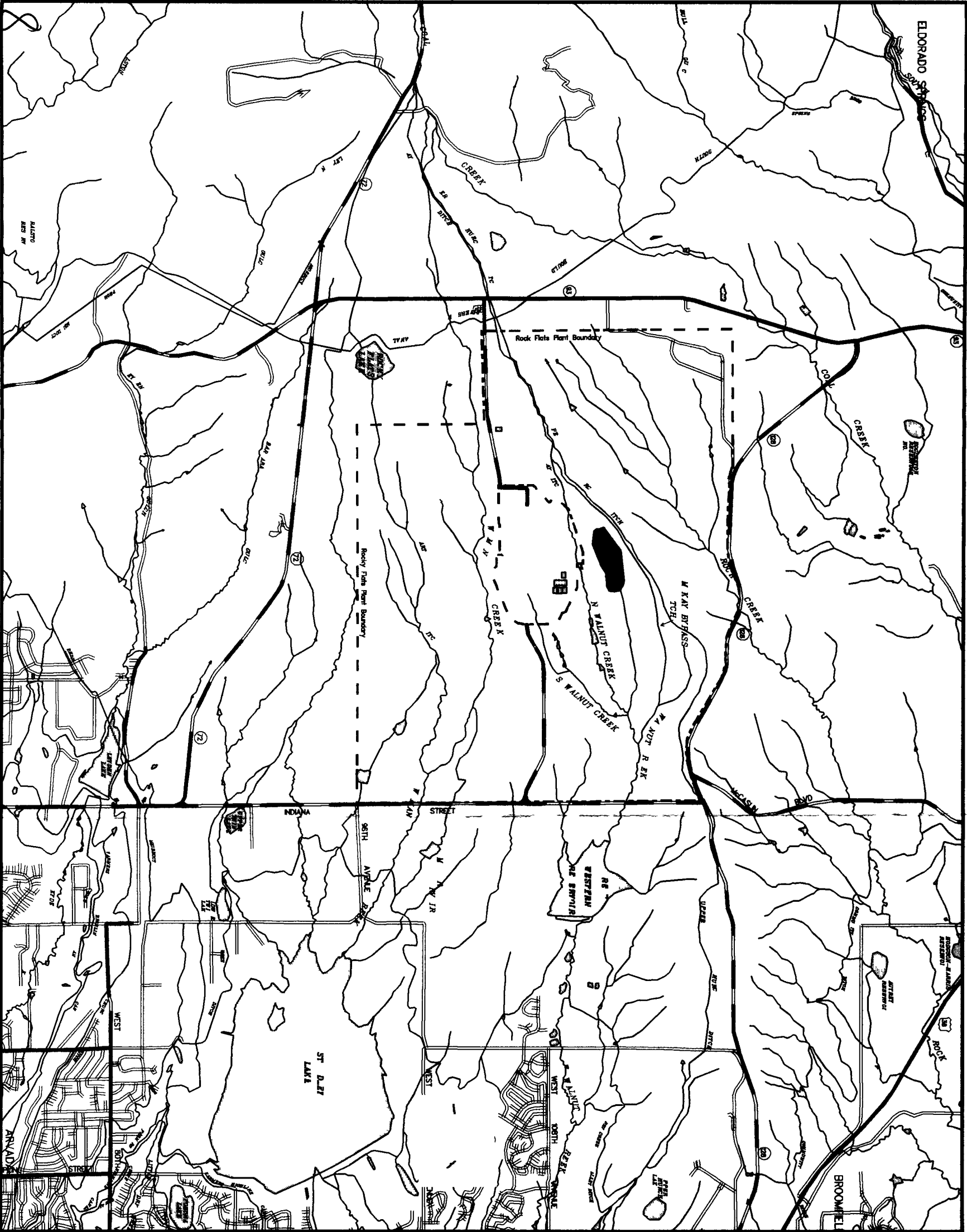
EG&G 1994a Potential Applicable or Relevant and Appropriate Requirements for Operable
Unit No 7 - Present Landfill (IHSS 114) and Inactive Hazardous Waste Storage Area (IHSS
203) EG&G Rocky Flats, Inc , Golden, Colorado

EG&G 1994b Personal Communication with Laura Brooks EG&G September 14, 1994

EPA 1993 Presumptive Remedy for CERCLA Municipal Landfill Sites EPA/540/F-93/035
September

25

Appendix A
Title II Design Not Included in this Document



EXPLANATION

- Streams
- Rocky Flats Site Boundary
- Primary Roads
- Secondary Roads
- Light-Duty Roads
- OU 7



Scale 1 inch = 4500 feet

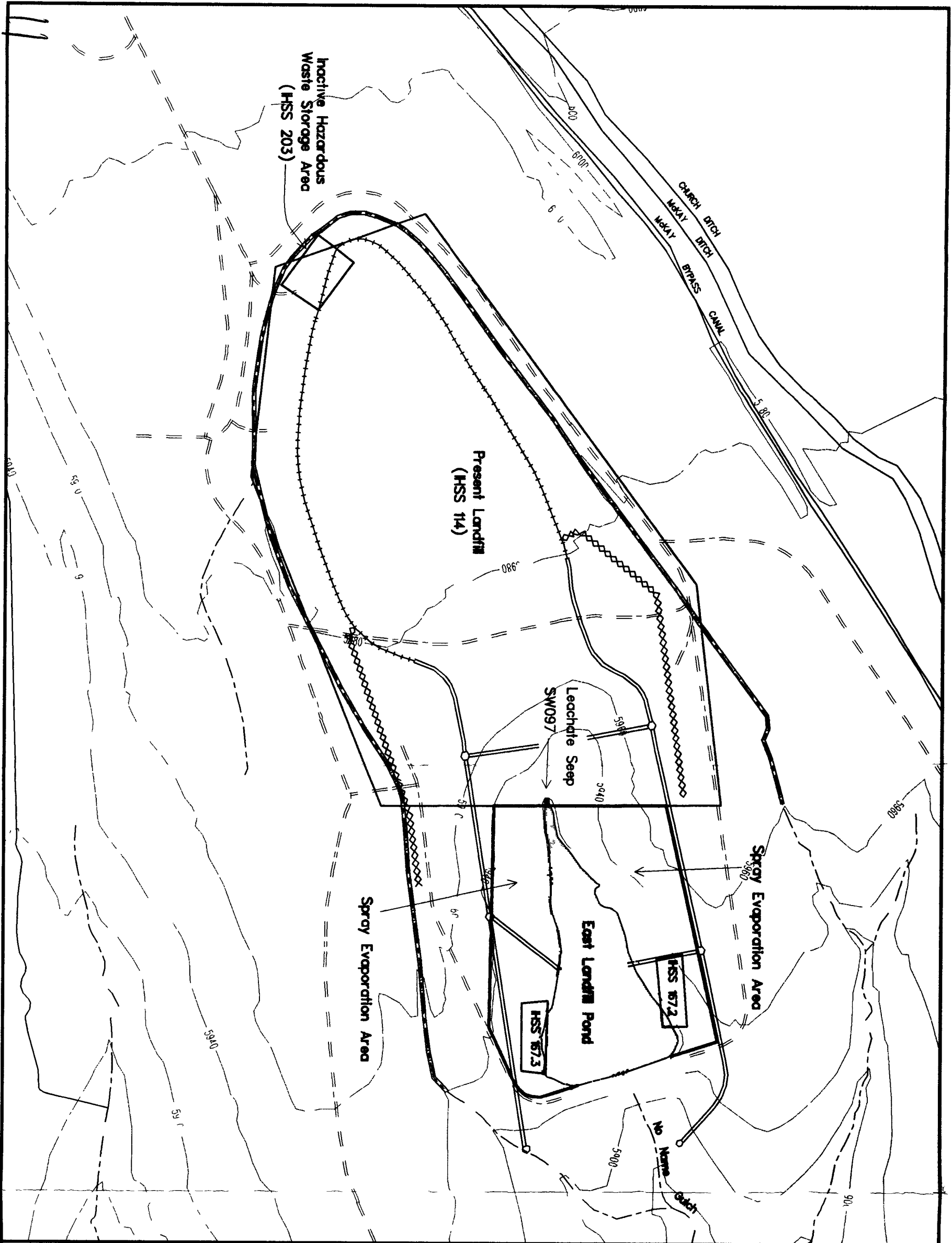
U.S. DEPARTMENT OF ENERGY
Rocky Flats Site, Golden, Colorado

Location Map
of
OU 7 Rocky Flats Site
and Vicinity

Proposed
Action Memorandum Operable Unit No 7

Date September 1994

Figure 1-1



EXPLANATION

- OU 7 HSS Boundary
- Spray Evaporation Area
- Ditch and Drainage Feature
- Intermittent Stream
- == Dirt Road
- == Existing Surface-Water Diversion Ditch
- xxxx Existing Slurry Wall
- Groundwater Intercept System
- (perforated)
- (non-perforated)



Topographic Contour Interval = 20 feet

U.S. DEPARTMENT OF ENERGY
Rocky Flats Site Golden, Colorado

Remedial Action Areas
and
Engineering Controls

Proposed
Action Memorandum Operable Unit No. 7

Date: September 1994 Figure 2-1